

Type R622 Pressure Reducing Regulator



Figure 1. Type R622 Regulator



WARNING

Failure to follow these instructions or to properly install and maintain this equipment could result in an explosion and/or fire causing property damage and personal injury or death.

Fisher® regulators must be installed, operated, and maintained in accordance with federal, state, and local codes, rules and regulations, and Emerson Process Management Regulator Technologies, Inc. instructions.

For LP-Gas service, an approved regulator (such as one listed by UL) should be used or approved by the Authority Having Jurisdiction. The installation in most states, must comply with NFPA 58 standard.

If the regulator vents gas or a leak develops in the system, service to the unit may be required. Failure to correct trouble could result in a hazardous condition.

Call a gas service person to service the unit. Only a qualified person must install or service the regulator.

Introduction

Scope of the Manual

This manual provides instructions for the installation, adjustment, maintenance, and parts ordering information for the Type R622 pressure reducing regulator.

Product Description

Type R622 direct-operated, spring-loaded regulators provide economical pressure reducing control in a variety of residential, commercial, and industrial applications. These regulators can be used with natural, manufactured, or liquefied petroleum gases and have the same inlet and outlet pressure capabilities.

Type R622

Specifications

Body Size and End Connection Style

1/2 NPT

Maximum Allowable Inlet Pressure⁽¹⁾

Operating: 125 psig (8,62 bar)

Emergency: 125 psig (8,62 bar)

Except 1.8 to 2.2-inches w.c. (4 to 5 mbar) spring range which has operating and emergency pressures of 60 psig (4,14 bar)

Maximum Allowable Outlet (Casing) Pressure⁽¹⁾

Operating to Avoid Internal Part Damage:

3 psid (0,21 bar d) above outlet pressure setting

Emergency: 20 psi (1,38 bar)

Outlet Pressure Ranges

See Table 1

Pressure Registration

Internal

Orifice Size

1/8-inch (3,2 mm)

Flow Coefficients

Wide-Open C_g for Relief Sizing: 12.5

Wide-Open C_v for Relief Sizing: 0.36

C_1 : 35

IEC Sizing Coefficients

X_T : 0.78

F_D : 0.82

F_L : 0.89

Internal Relief Performance

Start-to-Discharge is 8 to 22-inches w.c.

(20 to 55 mbar) for setpoints from

1.8 to 20-inches w.c. (4 to 50 mbar)

Start-to-Discharge is 140 to 200% over setpoint from 20-inches w.c. to 2.2 psig (50 to 152 mbar)

Spring Case Vent Connection

3/4 NPT with removable screen

Maximum Temperature Capabilities⁽¹⁾

-20° to 160°F (-29° to 71°C)

Approximate Weight

2.35 pounds (1 kg)

1. The pressure/temperature limits in this instruction manual or any applicable standard limitation should not be exceeded.

Table 1. Outlet Pressure Ranges

OUTLET PRESSURE RANGE	CONTROL SPRING PART NUMBER	CONTROL SPRING COLOR CODE	SPRING FREE LENGTH, INCHES (mm)	SPRING WIRE DIAMETER, INCHES (mm)
1.8 to 2.2-inches w.c. (4 to 5 mbar)	T14453T0012	Purple	3.40 (86,4)	0.051 (1,30)
5 to 7-inches w.c. (12 to 17 mbar)	T14398T0012	Orange	3.40 (86,4)	0.062 (1,58)
6.5 to 9-inches w.c. (16 to 22 mbar)	T14399T0012	Yellow	3.61 (91,7)	0.067 (1,70)
9 to 13-inches w.c. (22 to 32 mbar)	T14400T0012	Silver	4.10 (104)	0.072 (1,83)
13 to 20-inches w.c. (32 to 48 mbar)	T14401T0012	Gray	3.60 (91,4)	0.080 (2,03)
16 to 35-inches w.c. (40 to 87 mbar)	T14402T0012	Pink	3.52 (89,4)	0.093 (2,36)
1 to 2.2 psig (69 to 152 mbar)	T14403T0012	Light Blue	3.66 (93,0)	0.105 (2,67)

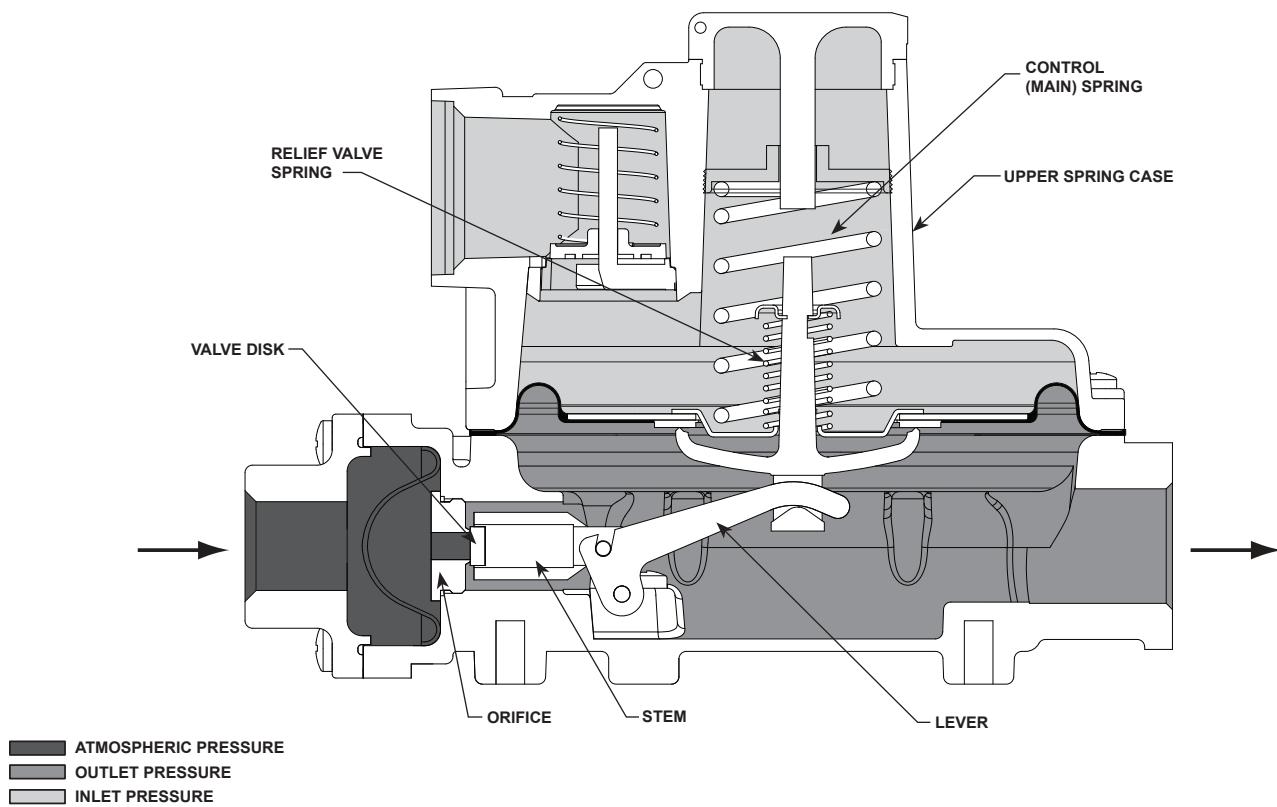


Figure 2. Type R622 Operational Schematic

In addition, Type R622 regulators have internal relief across the diaphragm to help minimize overpressure. Any outlet pressure above the start-to-discharge point of the nonadjustable relief valve spring moves the diaphragm off the relief valve seat, allowing excess pressure to bleed out through the screened spring case vent.

Specifications

The Specifications section lists operating conditions and other specifications of the Type R622 regulator. Information specific to a regulator's construction is stamped on the nameplate.

Principle of Operation

Refer to Figure 2. When downstream demand decreases, the pressure under the diaphragm increases. This pressure overcomes the regulator setting (which is set by a spring). Through the action of the pusher post assembly, lever, and valve stem, the valve disk moves closer to the orifice and reduces gas flow. If demand downstream increases, pressure under the diaphragm decreases. Spring force pushes the pusher post assembly downward and the valve disk moves away from the orifice. Type R622 regulators include an internal relief valve used to help minimize overpressure. Any outlet pressure above

the start-to-discharge point of the non-adjustable relief valve spring moves the diaphragm off of the relief seat, allowing excess pressure to discharge through the vent.

Installation

WARNING

Personal injury, equipment damage, or leakage due to escaping gas or bursting of pressure-containing parts might result if these regulators are overpressured or installed where service conditions could exceed the limits for which the regulators were designed, or where conditions exceed any ratings of the adjacent piping or piping connections. To avoid such injury or damage, provide pressure-relieving or pressure-limiting devices (as required by the appropriate code, regulation or standard) to prevent service conditions from exceeding those limits.

Additionally, physical damage to a regulator could cause personal injury and property damage due to escaping

Type R622

gas. To avoid such injury and damage, install the regulator in a safe location.

A regulator may vent some gas to the atmosphere in hazardous or flammable gas service, vented gas might accumulate and cause personal injury, death or property damage due to fire or explosion. Vent a regulator in hazardous gas service to a remote, safe location away from air intakes or any hazardous location. The vent line must be protected against condensation or clogging.

Before installing the regulator, check for damage which might have occurred in shipment. Also check for dirt or foreign matter which may have accumulated in the regulator body or in the pipeline. Apply pipe compound to the external threads of the pipeline and install the regulator so that the flow is in the direction of the arrow cast on the side of the body. The diaphragm actuator assembly can be rotated to any position relative to the body, in 90° increments.

Do not install the regulator in a location where there can be excessive water accumulation, such as directly beneath a downspout or in an undrained pit.

To obtain the maximum flow capacities or other performance characteristics, the length of pipe from the regulator outlet to the meter—or for the first 18-inches (457 mm), whichever is closer—should have no bends and should be the same size as the regulator outlet. Replace the regulator if water gets into the spring case or the lower casing of the regulator.

Type R622 regulators have a spring case vent (3/4 NPT) which is screened to prevent insects or foreign material from entering.



CAUTION

You are advised to use new vent piping because defective threads on the relief vent piping may interfere with the venting assembly if the piping obstructs the movement of the vent flapper.

On indoor installations, the vent should be piped outside the building, see Figure 3. Remove the screen from the regulator vent connection and connect vent piping from that connection to the outdoors. Vent piping should be as large in diameter as practical, be as short as possible, and have a minimum number of bends and elbows. Install a weather and insect resistant vent assembly on the outside end of the pipe, such as a Type Y602. The same installation

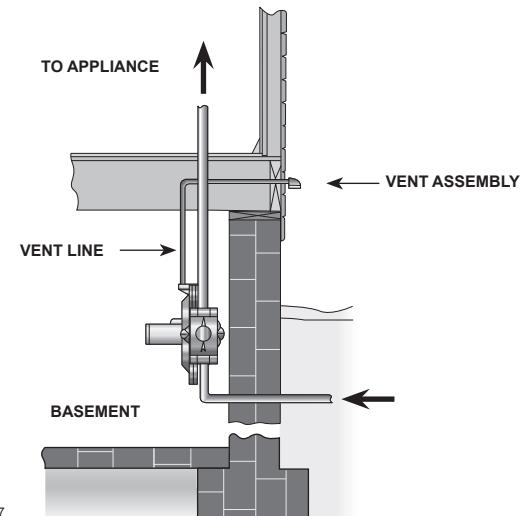


Figure 3. Typical Vent Line Installation

precautions apply to vent assemblies as the integral regulator vents described previously.

A program of regular inspection of the vent opening should be established to see that it has not become plugged by foreign material. On some installations, such as in areas of heavy snowfall, it may be necessary to install the regulator beneath a protective hood. If other protection is provided from the elements, the vent should be pointing or sloping down sufficiently to allow any condensate to drain. Also check the regulator periodically for external or internal corrosion.

Overpressure Protection



WARNING

Some type of overpressure protection is needed if actual inlet pressure can exceed the outlet pressure rating. Overpressuring any portion of this equipment above the limits given in the Specification section and table 1 may cause damage to regulator parts, leaks in the regulator, or personal injury due to bursting of pressure-containing parts or explosion of accumulated gas.

Type R622 regulators provide internal relief that limits the total outlet pressure build-up over setpoint. This internal relief may be adequate for most application, if not, provide additional pressure relief or a pressure-limiting device downstream. Regulators should be inspected for damage after any overpressure condition.

Startup



WARNING

To avoid personal injury or property damage due to explosion or damage to regulator or downstream components during startup, release downstream pressure to prevent an overpressure condition on the diaphragm of the regulator.

In order to avoid an overpressure condition and possible equipment damage, pressure gauges should always be used to monitor pressures during startup.

1. Check to see that all appliances are turned off.
2. Slowly open the upstream shutoff valve.
3. Slowly open the downstream shutoff valve
4. Check all connections for leaks.
5. Make final control spring adjustments according to the adjustment procedures.
6. Light the appliance pilots.

Adjustment

To increase the outlet pressure setting of the regulator, the adjusting screw (key 23, Figure 5) must be turned clockwise. This requires removal of the closing cap (key 31, Figure 5). To reduce the outlet pressure setting, turn the adjusting screw counterclockwise. A pressure gauge should always be used to monitor downstream pressure while adjustments are being made. Do not adjust the spring to produce an outlet pressure setting above the limit identified on the information label. If the required pressure setting is not within the range of the spring being used, substitute with the correct spring, see Table 1. When changing the spring, also change the range identified on the information label to indicate the actual pressure range of the spring in use. After the spring adjustment has been completed, replace the closing cap.

Shutdown



WARNING

To avoid personal injury or property damage due to explosion or damage to regulator or downstream components during shutdown, release downstream pressure to prevent an overpressure condition on the regulator diaphragm.

Installation arrangements may vary, but in any installation it is important that the valves be opened or closed slowly. These steps apply to the typical installation.

1. Slowly close the downstream shutoff valve.
2. Slowly close the upstream shutoff valve.
3. Open vent valves downstream of the regulator.
4. Open vent valves upstream of the regulator.

Maintenance



WARNING

Avoid personal injury or damage to property from sudden release of pressure or uncontrolled gas or other process fluid. Before starting to disassemble, isolate the regulator from all pressure and cautiously release trapped pressure from the regulator. Use gauges to monitor inlet, loading and outlet pressures while releasing these pressures.

These procedures are for gaining access to the diaphragm, valve disk and orifice. All pressure must be released from the diaphragm actuator assembly before the following steps can be performed.

While using the following procedures, refer to Figure 5 for key number locations.

Diaphragm and Disk Replacement

1. Remove the closing cap (key 31) and adjusting screw (key 23).
2. Remove the spring case machine screws (key 4) out of the spring case (key 25), and remove the spring case and control spring (key 22).
3. Lift the diaphragm assembly slightly, and slide it away from the lever (key 27), so that the pusher post (key 18) releases the lever.
4. Remove the diaphragm assembly (key 17). Examine the diaphragm assembly, replace if necessary.
5. Reassemble in the reverse order of the above procedures. Place the diaphragm assembly into position in the body (key 1), being sure the pusher post is properly hooked on the lever (key 27). Rotate the diaphragm so that the diaphragm and lower casing holes align. Check the diaphragm for proper orientation. Tighten the spring case machine screws (key 4) to 15 to 30-inch-pounds (2 to 4 N·m).
6. To remove the disk follow steps 1 through 4.
7. Remove screws (key 4).

Type R622

8. Remove lever (key 27)
9. Remove stem assembly (key 28)
10. Remove disk (key 33) from stem assembly (key 28). Examine the disk. If it is nicked, cut, or otherwise damaged, the disk should be replaced.
11. Put together in reverse order.

Inlet Screen and Orifice Replacement

1. Remove the regulator from line.
2. Remove machine screws (key 4).
3. Remove inlet O-ring (key 5). Lubricate a new inlet O-ring and place on inlet fitting (key 3).
4. Remove inlet screen (key 13). Clean and/or replace the inlet screen, if necessary.
5. Install the inlet screen (key 13) and inlet fitting (key 3). Then install and tighten the machine screws (key 4) to 15 to 30-inch-pounds-force (2 to 4 N·m).
6. To replace the orifice, follow steps 1 through 4, and then remove orifice (key 24) from body. Examine the seating edge of the orifice. If it is nicked or rough, it should be replaced. Treat the external threads of the new orifice with lubricant before reassembling, tightening to 15 to 20-inch-pounds (2 to 3 N·m) of torque.
7. Install the inlet screen (key 13) and inlet fitting (key 3). Then install and tighten the machine screws (key 4) to 15 to 30-inch-pounds-force (2 to 4 N·m).

Parts Ordering

The type number, orifice size, spring range, and date of manufacture are located on the spring case. Always provide this information in any correspondence with your local Sales Office regarding replacement parts or technical assistance. If construction changes are made in the field, be sure that the information label is also changed to reflect the most recent construction.

Parts List

Key Description	Part Number
1 Body, Aluminum	T80567T0GY2
2 Pipe Plug, Carbon steel (2 required)	1D8293T0022
3 Inlet Fitting, Aluminum	T21176T0BK2
4 Machine Screw, Carbon Steel (12 required)	T13526T0012
5 O-Ring, Nitrile (NBR)	T14431T0012
13 Inlet Screen, 18-8 Stainless steel	T14436T0012
16 Relief Spring, 302 Stainless steel	T13612T0012
17 Diaphragm	T21163T0012
18 Pusher Post, Acetal	T40653T0012
19 Lower Spring Seat, Zinc-plated steel	T14396T0012
20 Relief Spring Retainer, 18-8 Stainless steel	T13613T0012
22 Spring, Zinc-plated steel	See Table 1
23 Adjusting Screw, Delrin®	
For use with inches w.c. springs	T21186T0012
For use with psig spring	T21202T0012
24 Orifice, Aluminum	T21126T0012
25 Spring Case Assembly, Aluminum	T40655T0022
26 Vent Screen, 18-8 Stainless steel	T1121338982
27 Lever, Zinc-plated steel	T21197T0012
28 Stem Assembly	T14452T0012
29 Pin Lever, 18-8 Stainless steel	T14397T0012
30 Machine Screw, Carbon-plated steel (2 required)	1E175828982
31 Closing Cap	T21187T0012
33* Disk, Nitrile (NBR)	T14437T0012
38 O-Ring, Nitrile (NBR)	T14422T0012
41 Information Label	-----

*Recommended spare part
Delrin® is a mark owned by E.I. du Pont de Nemours and Co.

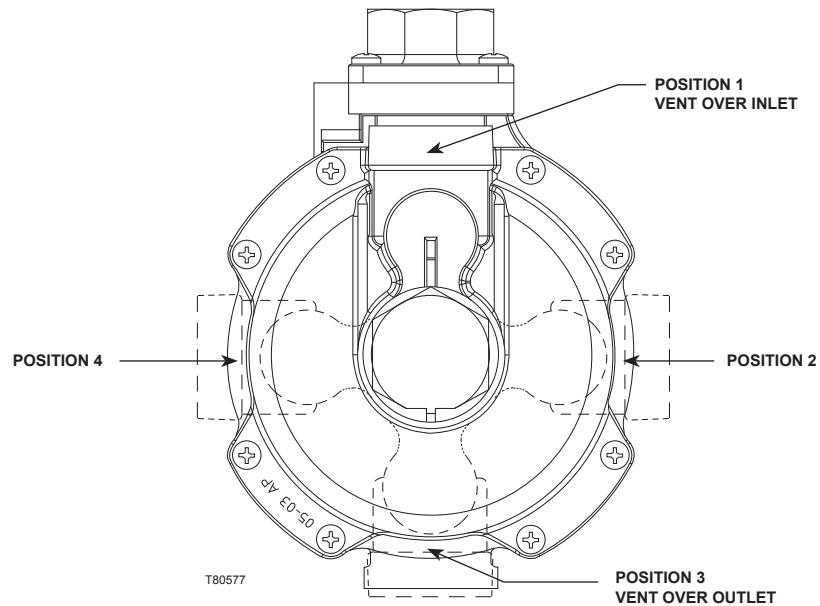


Figure 4. Vent Location

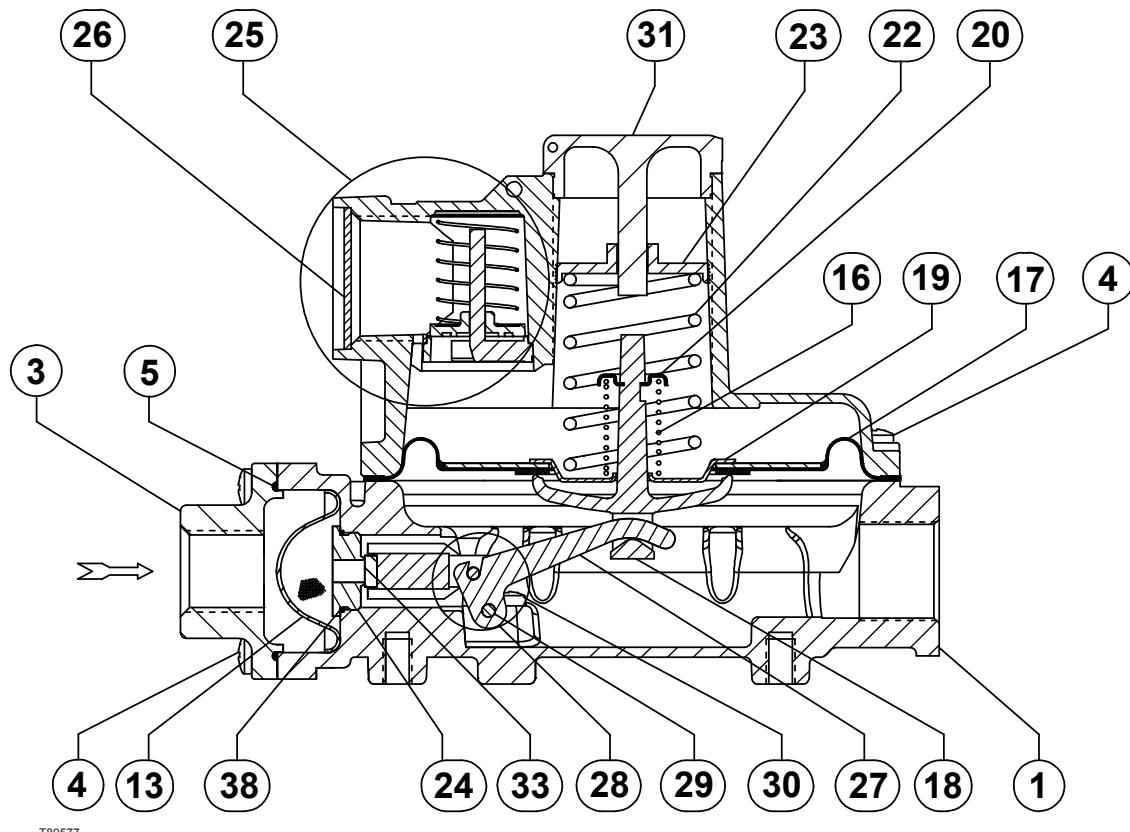


Figure 5. Type R622 Regulator Assembly

Type R622

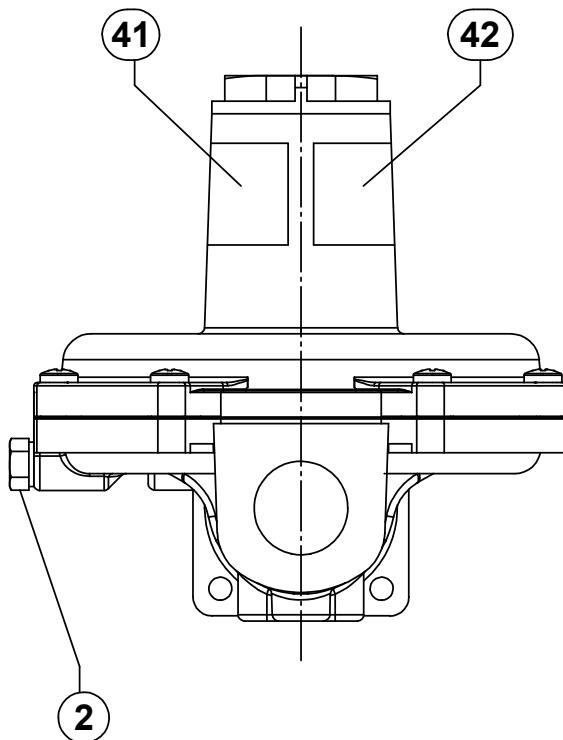


Figure 5. Type R622 Regulator Assembly (continued)

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